whole question is interesting and somewhat involved, on account of the length of time covered by the appearance of the different species, and while I felt impressed, on hearing the paper, with the fact that a great deal of excellent original work had been done at Champaign, and that the statements in the current literature (which is so largely unacknowledged compilation) would be effectually modified thereby, yet the authoritative statements, which have been based on observation, have not been materially impugned.

Further investigation will doubtless show that the fall or spring transformation is dependent to some extent upon latitude, and that, on this account, great irregularity may be looked for. There is here a rich field for careful study and experiment in different parts of the country, and it may turn out that the three-year period, which is pretty fully substantiated for the full life-cycle of some of the commoner forms, may be either shortened or lengthened according to latitude or species.

In this connection I would also put on record the fact that, according to Mr. Webster, from whom specimens have been received as having been obtained from Lachnosterna larvæ, an undescribed Tachinid and *Ophion bifoveolatum* may be added to the list of parasites which I have already recorded as attacking the larva of *fusca*.

Mr. Townsend presented the following paper:

NOTES ON NORTH AMERICAN TACHINIDÆ SENS. LAT., WITH DESCRIPTIONS OF NEW SPECIES.

PAPER I.

BY C. H. TYLER TOWNSEND.

In the first families of the *Tachinidæ s. lat.* much confusion has resulted from the descriptions of the earlier authors, due in great part to the fact that the two sexes of these flies exhibit marked differences, which would lead one to consider them distinct species. From a critical study of descriptions and material I have collected a considerable number of notes, synonymical, relating to distribution, etc., which I here present, together with descriptions of some new species.

Phasia atripennis Say. This is not a *Phasia*. The description shows that the apical cell is petiolate, and compares the venation to that of *Phasia semicinerea* Meig., which however

is an *Alophora* sens. Schiner, of the sub-genus *Hyalomyia.** Meigen's figure misled Say. This species probably does not belong in the *Phasiidæ* at all. I am inclined to refer it to the genus *Wahlbergia* in the *Phaniidæ*. The description agrees well with *W. atripennis* (see description of latter in this paper), yet there is room for doubt, as it entirely omits mention of the most important characters. Under these circumstances, I believe it advisable to indicate *Phasia atripennis* Say as a doubtful synonym of *Wahlbergia atripennis* nov. sp., and it may be so considered until it is identified as distinct.

Hyalomyia occidentis Wlk. and *H. triangulifera* H. Lw. I can identify none of the following four new species with either of the above.

Hyalomyia punctigera n. sp.

Male—Eyes reddish-brown, rather closely approximated just in front of the ocelli; front narrow, widening toward the antennæ; vitta black, obsolete in front of the vertex, much widened at the base of the antennæ, being thus triangular, with a row of fine black bristles on each side; sides of front silvery; face and ocellar borders silvery, the epistoma very strongly, unusually produced; antennæ blackish; proboscis and palpi blackish, the latter slender, rather elongate, and much enlarged at the tip; occiput black, silvery pollinose on the sides and below, brownish near the vertex, gray hairy below; cheeks silvery, gray hairy below. Thorax above black, slightly brownish pollinose, with short black hair; shoulders and pleuræ slightly brownish or cinereous; scutellum shining black; thorax and scutellum with black bristles on the sides and behind. Abdomen black, with an interrupted, somewhat indistinct, median black vitta; first two segments shining, with a metallic greenish luster, covered with short black hair; last two and anal segments, and median hind border of second segment, metallic, cinereous pollinose, covered with short, black, scattered hairs, each one arising from an opaque black dot, this punctation rather more distinct than in other species; venter concolorous, slightly cinereous on the posterior half. Legs black, black hairy, especially the femora, which are considerably enlarged; pulvilli whitish, claws black, elongate. Wings hyaline, broadly tawny at base; tegulæ tawny, forward scales partly whitish; halteres tawny.

Length of body, 5 mm.; of wing, 4 mm.

One specimen. Dixie Landing, Va. (D. C.). This is a very distinct form in the unusually prominent epistoma, the club-like palpi and the enlarged femora. No doubt further specimens will vary from the above in the extent of the cinereous on the abdomen.

*Mr. E. Girschner has referred this to a new sub-genus, *Paralophora*. See Zeitschr. für Naturw., Bd. LX, 1887. Separate, 1888, p. 38.

Hyalomyia aldrichii nov. sp.

Male—Black. Eyes brown, closely approximated in front of the ocelli, thus very much narrowing the front at this point; vitta nearly or quite obsolete, only showing as a triangle at base of antennæ, brownish or nearly black; sides of front silvery, extending to the vertex as a silvery vitta, with a row of fine black bristles on each side; face and ocellar borders black, cinereous pollinose; antennæ black, slightly cinereous; proboscis black; palpi blackish, thread-like, very slightly or scarcely at all enlarged at the tip; cheeks black, silvery pollinose, gray hairy; occiput black, black hairy on upper border, silvery pollinose on sides and below. Thorax and scutellum shining black, of a metallic, very dark greenish luster, with black bristles on the sides and behind; shoulders and pleuræ concolorous, very slightly, almost imperceptibly, cinereous. Abdomen black, metallic, with a median interrupted, or almost obsolete, black line; first segment shining, with a dark greenish reflection, clothed with short black hair; remaining segments cinereous pollinose, with scattered black hairs, each arising from a black dot; venter concolorous, anal half more or less cinereous. Legs black, black hairy, especially at enlarged femora; pulvilli whitish. Claws black, rather elongate. Wings hyaline, slightly yellowish at base; tegulæ nearly pure white, hind scale faintly grayish; halteres slightly yellowish, more or less dusky.

Female—Differs from the male in having the eyes still more closely approximated, almost contiguous, and the claws very short. The frontal vitta is more distinct, and continued to the vertex as a narrow line. The shoulders and pleuræ also are more cinereous. The anal or fifth segment, present in the ♂, is wanting.

Length of body, 3 to 3½ mm.; of wing, 3 mm., or slightly more.

Described from 2 ♀ and 2 ♂ specimens. Brookings, South Dakota. From Mr. J. M. Aldrich. A third ♂ from the same locality differs in being smaller and much narrower, but is probably the same species.

Hyalomyia robertsonii n. sp.

Female—Eyes almost contiguous in front of the ocelli; front cinereous, bristly on each side of the black vitta, which is widened towards the antennæ; antennæ black, third joint cinereous; face and cheeks cinereous, the latter with fine whitish hairs; proboscis blackish, palpi rather short, slender, not enlarged at tip, tawny, blackish at base; occiput cinereous, with short black hairs, becoming whitish below; vertex with a posterior pair of bristles directed backward, one at each vertical angle, and an anterior pair situated between the three ocelli, directed forward. Thorax black above, cinereous on the sides, with black bristles on the sides before the wings, and on the posterior part of the dorsum; scutellum black, with four black bristles. Abdomen slightly cinereous,

the basal segments more or less metallic, black or greenish, the terminal segments more or less distinctly black punctate; venter slightly cinereous. Legs black, with a very faint grayish shimmer in some lights; claws short, pulvilli small, whitish or testaceous. Wings nearly hyaline, basal and costal portions deep tawny; tegulæ tawny, forward scale somewhat lighter; halteres tawny.

Length of body, 4 to 4½ mm.; of wing, 3½ to 4 mm.

Two females from Mr. Charles Robertson, Carlinville, Ills. This species is easily to be distinguished from *punctigera* by the much less prominent epistoma and the rather short, not club-like palpi. The femora also are scarcely enlarged. From *aldrichii* it may be distinguished by its slightly larger size, by the tawny tegulæ, which are white in that species, and by the palpi being largely tawny instead of wholly black.

Hyalomyia purpurascens n. sp.

Male—Face and front black, cinereous pollinose; eyes rather widely separated, brownish or reddish; frontal vitta as a narrow line between the eyes but widened towards the base of the antennæ, black, with a row of fine black hairs on each side; antennæ very small, black, third joint cinereous; proboscis blackish, palpi very small, tawny or testaceous; cheeks and occiput black, cinereous pollinose, the former below the eyes with fine whitish hairs, the latter with short black bristly hairs; vertex with short bristles. Thorax black, shining, slightly cinereous on the sides, with bristly hairs on the sides and bristles on the dorsum behind; scutellum black, with four bristles. Abdomen metallic, very dark green, usually with a decidedly purplish tinge on the second and third segments, the fourth segment, and sometimes the sides of the others, more or less ashy, black punctate; venter black, more or less cinereous. Legs black, the hind tibiæ with a few black bristles, the femora slightly enlarged; claws long, pulvilli whitish. Wings hyaline or grayish, basal portions tawny; tegulæ tawny or whitish; halteres tawny.

Female—Differs from the male in the eyes being contiguous just in front of the ocelli, the claws short, and the abdomen not purplish, more broadly punctate.

Length of body, 2½ to 3½ mm.; of wing, 2 to 3 mm.

Described from four males and four females, from Mr. Charles Robertson, Carlinville, Ills. This is a much smaller species than the three preceding.

Trichopoda ciliata Fab. Wiedemann's description of this species makes it very evident that he was describing the ♀. Brauer and von Bergenstamm (Vorarb. Mon. Muscaria Schiz., 147) indicate this to be the ♀ of *pennipes*. I believe this synonymy to be correct.

T. cilipes Wied. This is Fabricius's *Thereva pennipes* (Syst. Antl., 219, 8). The description is of the ♂. I believe this species to be the ♂ of *hirtipes*. I have a pair, taken *in coitu* June 22, which, with several other specimens taken singly, correspond with these two descriptions. The males have the wings milky and tawny radiate, the tawny being more or less in the form of a blotch.

T. flavicornis Rob. Desv. Robineau Desvoidy described the ♂.

T. formosa Wied. I have 3 ♂ and 2 ♀ of this species from this vicinity. It is very near *radiata*, but is somewhat less robust. (See *T. radiata* and *T. lanipes*.)

T. hirtipes Fab. All the descriptions of this (Fab., Wied., Rob. Desv.) are of the ♀, and I believe it to be the ♀ of *cilipes*. (See *T. cilipes*.)

T. lanipes Fab. Wiedemann, Fabricius and Robineau Desvoidy describe its ♀. Brauer and v. Bergenstamm (l. c.) indicate this to be the ♀ of *formosa* F. I know of no *formosa* described by Fabricius. If Wiedemann's species is meant, the synonymy is incorrect. That author mentions both sexes, in which he was evidently mistaken, for he describes only the ♂. The ♀ of *formosa* Wied. has the abdomen orange on the basal half, while *lanipes* is entirely coal-black.

T. pennipes Fab. This is Fabricius's *Dictya pennipes* (Syst. Antl., 327, 5). It is found over the eastern half or more of the United States and in Mexico. All the descriptions are of the ♂. Say's *Phasia jugatoria* is the ♀ of this species. Baron Osten Sacken, in his note on Say's description, has the sexes changed. Say described the ♀. It is the ♂ that has the ferruginous or yellowish patch on the front of the wing, and the abdomen entirely ferruginous, though males also occur which have the abdomen faintly tipped with black. This (Say's *jugatoria*) is probably the same sex of the same species which Fabricius described as *ciliata*.

T. plumipes Fab. All the descriptions (Fab., Wied., Rob. Desv.) are of the ♀. The only difference between this species and *lanipes* seems to be that this has golden and *lanipes* white lines on the thorax. If this difference does not exist they are probably the same. I have never seen this species.

T. pyrrhogaster Wied. The description seems to be of the ♀. Mr. van der Wulp records this species from Guatemala (Biol. Centr.-Am.), and Mr. von Röder records it from Porto Rico.

T. radiata H. Lw. This is our largest and most striking species. Lœw described the ♂. I am confident that I have the ♀ in two specimens which have the sides of the face silvery instead of golden, the wings entirely black and the abdomen

cylindrical, red, with the tip black. I was at first much inclined to regard this as a synonym of *formosa* Wied. I have noticed that the broad-bodied ♂ ♂, when fresh and first captured, have the abdomen of a very distinct red as well as purplish hue, which settles into a dull purplish black as the specimen becomes older. The reddish bases of the femora vary much also, in some of my specimens being just perceptible, while in others the whole basal half is red. In one specimen the palpi are darker than in the others. My specimens of *formosa* have the palpi reddish or nearly black; all but one have the bases of the femora perceptibly red, while some of the males have the abdomen purplish, and it nearly always becomes purplish-black after drying for some time. Therefore, the distinguishing characters which Lœw pointed out between his species and *formosa* are not constant enough to be of much service. The two species are, however, both valid, and are easily distinguished, when a series of each is compared, by the wider abdomen in the ♂, and the wider head and thorax and general greater robustness in both sexes of *radiata*. *T. formosa* uniformly has a narrower head and body, and is less robust. There are no constant and well-marked colorational differences between the two, but *formosa* as a rule has darker palpi, less red on the femora, and less purplish on the abdomen of the ♂.

T. trifasciata H. Lw. I have a ♂ of this species from Kansas. It agrees well with Lœw's description, though the anal segment, as well as the three preceding, has a golden or brassy fascia, which is less interrupted in the middle than the others.

T. haitensis Rob. Desv. The ♀ is described. Mr. V. v. Röder (Dipt. Insel Portorico, Stett. Ent. Zeit., 1885, 344) makes this a synonym of *pyrrhogaster*. The latter seems to be somewhat larger than *haitensis*, and they are both evidently the same sex. I feel safe, however, in accepting Mr. v. Röder's synonymy as correct.

T. mexicana Macq. I have not seen the description of this species.

T. nigricauda Bigot. I believe this to be the ♀.

T. flava v. Röder, l. c., 343, 344. Porto Rico. This is a remarkable and exceptional species in its coloration, as it is almost entirely yellow, including the wings. From the fact that the face is golden, and from the general showy coloration, it is probably the ♂ that is described. The ♀ is always the more sombre of the two.

T. histris Walker, List. IV, 697, without locality. I have little doubt that this is *T. trifasciata* H. Lw. The description agrees in every particular, except that Walker's specimen

seems to have had only two abdominal fasciæ, while Lœw's had three, and a specimen of my own four. (See *trifasciata*.) Walker describes the ♂, and his description is sufficiently recognizable to stand, certainly so if the locality had been appended. The species, however, cannot fail to be American, as I know of no *Trichopoda* from any other part of the world.

Trichopoda aurantiaca nov. sp.

Male—Black and orange; like *T. formosa* Wied., but smaller and less robust. Head rather wide, eyes large, brownish; front about one-fourth the width of the head, the velvety black vitta occupying its entire width at the vertex and a little widened at the bases of the antennæ; sides of front and borders of eyes below golden yellow; face silvery pollinose, a blackish shining surface just above the epistoma; antennæ, including bristle, blackish, slightly silvery in some lights; cheeks yellowish, silvery pollinose and gray hairy; mouth parts light, proboscis black or brownish, palpi very dark brown; occiput black, silvery pollinose. Thorax black, with four short longitudinal brassy, slightly whitish, lines in front running back to a transverse one, the inner pair and the transverse line very delicate, the outer pair heavy and somewhat golden; thorax with black macrochetæ on the sides and hind portion, hind border silvery; scutellum black, silvery behind, with a black macrocheta on each side and a pair at the hind angle; pleuræ silvery pollinose. Abdomen flattened, rather square oblong, not very wide, of a light orange color shading into rusty toward the tip, its extreme base more or less black, everywhere covered with short black bristly hairs; anal segment with a silvery reflection; venter concolorous. Legs black, thickly clothed with short black bristles, the bases of the femora orange; coxæ silvery; hind tibiæ thickly black ciliate, or feathered; claws and pulvilli yellow, elongate, surmounted with a few fine, black, bristly hairs. Wings black, slightly white radiate, with an elongate longitudinal yellow or tawny spot in the middle near the front border; inner margin of wings narrowly hyaline, not reaching the apex; tegulæ light orange, forward angle pure white; halteres orange.

Length of body, 11 mm.; of wing, 9 mm.

One specimen. Dixie Landing, Va. (D. C.). July 6, on sumach bloom. This species is near *formosa*. It differs from it in being less robust, in the much smaller and narrowed abdomen, which is orange-colored. From *cilipes* (syn. *hirtipes*) it differs in the smaller, rather square oblong abdomen of equal width, not bulging on the sides, and the delicate whitish brassy, not heavy golden, markings of the thorax. Of course, in the above differences I refer only to the ♂ ♂. I have a single ♀ that may belong to this species, but it is doubtful. The abdomen is narrower, more cylindrical, more

pointed at the end than in the ♀ ♀ of other species, and is broadly tipped with black. The claws are shorter, hooked, and the tips black. This is the case with the ♀ ♀ of most species; the claws of the ♂ ♂ are usually linear and entirely yellow.

Acaulona costata v. d. Wulp, Biol. Centr.-Am., Dipt., II, 4. This exceedingly interesting new genus and species of *Phasiidæ* is founded on the description of two specimens, which Mr. van der Wulp refers with a query to the ♂ sex. The very short claws and pulvilli mentioned would indicate the ♀. The genus has much the facies of *Trichopoda*, as may be seen from the excellent colored figure.

Gymnosoma filiola H. Lw. I have taken this species here, and have also specimens from Iowa, Nebraska, South Dakota (Aldrich), and Minnesota (Lugger), while Lœw described it from Texas, and Mr. v. Röder has determined it in a collection of flies from Porto Rico (l. c., 344). Lœw mentions in his description that he had not observed any ♀ ♀ to have the widely dilated abdominal spots so frequently seen in larger species. I have, however, ♀ ♀ in which the black markings extend over nearly the whole abdomen.

G. fuliginosa Rob. Desv. This is our largest and most robust species. It is abundant here, and I have taken it in Michigan. The ♀, as in all Gymnosomas, has black on each side of the front, the face with a silvery reflection, the thorax wholly black shining, and the abdominal markings dilated. The ♂ has only the lateral angles of the vertex black, the face with a golden reflection, the forward part of the thorax with yellowish or brassy pubescence, and the abdominal markings confined to several small, round black spots. The claws are nearly the same length in both sexes, but the wings of the ♂ are as a rule slightly smaller than those of the ♀. Desvoidy described the ♂. It is perhaps a question whether this is not the same as *G. rotundata* L. of Europe (see v. d. Wulp, Tijd. v. Ent., 2d ser., II, 136).

G. occidua Wlk. This is, without doubt, as Dr. Williston has pointed out (Tr. Am. Ent. Soc., XIII, 296), the ♀ of *Cistogaster divisa* H. Lw. But Dr. Williston seems, in his paper, to accept Lœw's name, whereas Walker's, as it is accompanied by a recognizable description, ought to stand on its priority.

G. par Wlk. This may best be placed as a synonym of *fuliginosa* R. D., until some one decides from examination of the type in Cambridge that it is not identical. There is little doubt of its being the same.

G. latreillei Rob. Desvoidy, Myod., 237. The description is accompanied by the remark: "I do not know the country of this species; observed in the collection of the Count Dejean." I venture to rescue this from the fugitive list and refer it to North America, probably Carolina. From Desvoidy's description I have little doubt that it is the ♀ of *fuliginosa*.

G. atra Rob. Desv., Myod., 238. This is another of Desvoidy's fugitive species, which he found in Dejean's collection. I strongly suspect that it is the same as *Cistogaster pallasii* n. sp., described in this paper. If it is the same, I am rather surprised that Desvoidy did not refer it, on account of its short antennæ, to his genus *Pallasia* (syn. of *Cistogaster*). If, however, he trusted to the appearance of the specimen, its habitus is strikingly like *Gymnosoma*.

Cistogaster divisa H. Lw. This should be known as *occidua* Wlk. Lœw described the ♂ of Walker's species. It is found from Connecticut and District of Columbia to South Dakota (Aldrich), Colorado and California (Williston). There is little reliance to be placed on the character of the apical cell in this genus. While *Gymnosoma* uniformly has it petiolate, twenty-two specimens of *C. occidua* that I have examined have it petiolate (all ♂ ♂), and eleven have it closed in the border (seven ♀ ♀ and four ♂ ♂). The females of this species vary very much. I have one in which the abdomen is of the same bright ferruginous as that of the ♂, while a small specimen has the abdomen of a uniform black, nearly like *pallasii* n. sp., but not shining as in that species. In some females also the black on the sides of the front is of much greater extent and very pronounced. While the claws in *Gymnosoma* are nearly the same length in both sexes, those of the ♂ are much elongated in *Cistogaster*.

C. immaculata Mcq. I have not seen the description of this species.

Cistogaster pallasii nov. sp.

? Syn. *Gymnosoma atra* Rob. Desv.

Female—Wholly black. Front about one-third the width of the head, shining black on the sides with black hairs; vitta dark reddish-brown, of nearly equal width; face and borders of the eyes silvery white, pollinose; antennæ short, brownish, black at the tip; second joint reddish on the sides, slightly silvery in some lights, with a few black hairs on its dorsum; third joint a little longer than the second, reddish at base, the remainder black; proboscis blackish, palpi light reddish-yellow; cheeks and occiput cinereous pollinose, gray hairy on the sides and particularly below, with black hairs on the upper border. Thorax shining black,

without opaque on pollinose lines; humeri and pleuræ cinereous pollinose, the former slightly brassy in certain lights; scutellum shining black, with black bristles. Abdomen round, shining black, with thin black depressed pubescence becoming thicker on the edges; venter black. Legs wholly black, femora hairy, tibiæ hairy with a few bristles; pulvilli reddish, claws short. Wings small, hyaline, yellowish or tawny at base, the apical cell petiolate; tegulæ white, hind scale faintly tawny; halteres yellowish.

Length of body, 5 mm.; of wing, 4 mm.

One specimen. Brookings, South Dakota. From Mr. J. M. Aldrich. Further material will perhaps show specimens with the apical cell closed in the border, not petiolate.

Ocyptera arcuata Say. This must be known as *Wahlbergia arcuata*. I had referred it to this genus from the description alone, without examination of specimens. Later I received from Mr. Charles Robertson, of Carlinville, Ill., two ♂ ♂ and two ♀ ♀ that I am able to identify as this species, which has remained unknown since Say described it in 1829. Say's description was probably made from a female. The female differs from the male in having the dorsum of the thorax in front blackish in the middle, with the golden pubescence in a broad band on each side; in the face and sides of the front being silvery; and in the abdomen being pointed at the extremity, more conspicuously and compactly marked with black, the tip being wholly black above. The male has the thorax in front with golden lines, also in the middle; the face and sides of front golden; the abdomen blunt at the extremity, and the segments with the black slightly separated at the sutures.

O. (*Hemyda*)*aurata* Rob. Desv. The genus *Hemyda* is very distinct from *Ocyptera*. (See v. Röder, Berl. Ent. Zeitschr., XXV, 212; and Williston, Tr. Am. Ent. Soc., XIII, 297.)

O. carolinæ Rob. Desv. This is very near Walker's *dosiades*. Desvoidy states that the tegulæ are sub-fuliginous, and the thorax dull black tinged with brownish. The tegulæ of *dosiades* are white, and the thorax is shining, polished black. The other characters given by Desvoidy agree well with specimens which I refer to Walker's species.

O. dosiades Wlk. I have four ♂ and three ♀ specimens from this vicinity which I refer to this species, though the third antennal joint is scarcely twice as long as the second. I have also one ♂ from Minnesota (?) and two ♀ ♀ from here, which are smaller, but are likely the same species. The males have the claws elongate, while in the female they are very short. This seems to be our smallest form of *Ocyptera*.

O. epytus Wlk. I can see very little difference between the descriptions of this and the following species. This description was probably drawn from a small specimen of *euchenor*, and I should regard it as a synonym of that species, the description of which is better applicable to most of the specimens.

O. euchenor Wlk. I identify one ♂ from this vicinity, one ♂ from Iowa, two ♂ ♂ from Minnesota (?), and two ♂ ♂ and three ♀ ♀ from southern Illinois (Robertson), with this species.

O. liturata Olivier. I fail to identify this species in my material. It is, without much doubt, an *Ocyptera*, though the description of some of the parts, especially the wings, is wonderfully like *Trichopoda*.

O. dotadas Wlk. The description says that the abdomen is linear, which doubtless here means slender. The only differences I can perceive between the descriptions of this species and *dosiades* are that in this the median black abdominal vitta seems to be obsolete, the wings are longer, and the balancers are black instead of tawny. If I have put the right construction upon these points, the species is no doubt valid. The descriptions are exactly alike in all other particulars.

O. binotata Bigot, Ann. Soc. Ent. Fr., 1878, 44. This appears to be the same as *euchenor* Wlk. It is a much larger species (10 mm.) than *dosiades* Wlk.

Ocyptera argentea nov. sp.

Male—Black, silvery pollinose. Eyes dark brown; front nearly or quite one-third the width of the head, not nearly so broad as the face; vitta black, of equal width, with a row of black bristles on each side; sides of front borders of the eyes and face silvery-white pollinose, grayish in some lights; antennæ black, third joint only a little longer than the second; proboscis black; palpi undeveloped; cheeks and occiput gray hairy, silvery-white pollinose; a pair of long black bristles on the vertex, one on each side of the ocelli. Thorax black, with a silvery reflection, covered with black macrochetæ; shoulders and pleuræ silvery pollinose, also three longitudinal, abbreviated silvery vittæ on the middle of the front portion of the thorax; scutellum black, with a faintly silvery reflection, four-sided, narrower posteriorly, with black macrochetæ on its sides and behind. Abdomen black, shining, with lateral and dorsal pairs of black macrochetæ always near the hind margin of the segments; second segment and front half of third obscurely red on the sides, the red often hardly perceptible from above; forward half of third and fourth segments broadly silvery-white pollinose on the sides; venter black, second segment and a part of third red. Legs black, coxæ and the hind surface of the front femora silvery-pollinose, femora and

tibiæ with black macrochetæ; pulvilli tawny or testaceous; claws black, elongate. Wings smoky, gradually sub-hyaline on the inner margin, more or less yellowish at base; tegulæ white, sometimes faintly yellowish on the internal or the whole border; halteres black.

Female—Differs from the ♂ in the very short claws, and in the more nearly equal width of the front and face when viewed from before.

Length of body, 10 to 11 mm.; of wing, 7 mm.

Three ♂ ♂ from District of Columbia and one ♀ from Iowa. It differs from *euchenor* in the sides of the second and third abdominal segments not being clearly red, but the third segment covered with silvery-white pollen in front like the fourth. The whole insect is more deeply black and the antennæ are entirely black.

Wahlbergia atripennis nov. sp.

? Syn. *Phasia atripennis* Say.

Male—Black and light orange. Head wider than the thorax; eyes large, brown; front nearly one-third the width of the head, with a broad, deep black, velvet-like vitta occupying the entire width at the vertex, but narrower towards the antennæ, at the bases of which it widens again; sides of the anterior three-fourths of the front, with the borders of the eyes, bright golden, face light yellow; antennæ short, blackish, third joint nearly the same length as the second, reddish at base, the second joint shading to reddish and black bristly; proboscis black or brownish, geniculate, the upper membranous portions whitish; palpi light reddish-yellow, black hairy; cheeks and occiput silvery, with grayish hairs below and black hairs on the upper border. Thorax velvet black, with black bristles, the transverse suture golden, irregularly defined in front, humeri broadly golden; posterior margin of mesoscutum golden, extending forward nearly to the transverse suture; pleuræ silvery, upper portions golden in certain lights; scutellum black, with black macrochetæ. Abdomen cylindrical, of a clear light orange-yellow, covered with short black depressed bristles, becoming thinner on the sides and venter; first segment deep black at base, in some specimens nearly all black, in others just touched with black; fifth and sixth segments and posterior or greater part of dorsum of fourth, with median dorsal spots of second and third segments, usually much darker, of a light rusty or pale ferruginous; a median dorsal pair of sub-erect short black macrochetæ near the posterior border of each segment; venter of first three segments and often a portion of the fourth light yellow, at tip blackish. Legs black, basal third to half of front and middle femora and three-fifths of hind femora orange-yellow; coxæ yellowish, covered with silvery pollen; femora evenly covered with short depressed bristly hairs; rest of legs rather more finely hairy, tibiæ in addition with a few strong bristles, usually about 8 or 10 on each hind tibia and from 1 to 5 or 6 on the front and middle pairs; claws long, of equal length with the

pulvilli, which are dusky. Wings smoky, almost black on the costal half and at base, the inner margin gradually sub-hyaline; apical cell rather long petiolate, hind cross-vein more or less bowed out; tegulæ light orange-yellow, the anterior half and smaller forward scale pure white, with the borders faintly yellow; halteres light orange-yellow.

Length of body, 6 to 7 mm.; of wing, 5 to 6 mm.

Dixie Landing, Va. (D. C.). Four specimens taken Oct. 5, on flowers of aster, etc.

This species at first sight exactly resembles a small *Trichopoda*, but is easily distinguished from that genus by the bare hind tibiæ, long-petiolate apical cell, and the short abdominal pairs of macrochetæ.

Schiner defines *Besseria* (syn. of *Wahlbergia*) as having the hind cross-vein straight. Lœw's description of *W. brevipennis* states that vein to be strongly oblique. In the above species it is arcuate, and the fourth longitudinal vein is flexed or rounded, not angulated, where it bends to meet the third.

Mr. Schwarz presented the following note:

FEEDING HABIT OF A SPECIES OF EMPIDÆ.

By E. A. Schwarz.

That the *Empidæ* are predaceous Diptera is well known, but since I do not find in the more accessible literature (although no particular search has been made) any published record regarding their mode of feeding, I venture to communicate a little observation made by myself the present summer. A species of the genus *Syneches* (probably an undescribed species) was very abundant in the mountains at Ft. Pendleton, Md., during the first part of July. During daytime these flies rest on the under side of leaves, etc., in the shadiest parts of the woods. Toward evening they fly about in the more open places and capture little gnats and other minute Diptera. Holding their prey between the legs, and their body being in vertical position, they slowly fly toward the nearest bush, and, without alighting, most dexterously manage to take hold of the edge of a leaf with the claws of the right or left front leg. The long and very sharp claws are well adapted for taking a firm hold on the surface of the leaf, and the long pulvilli assist in the operation by pressing on the edge or the under side of the leaf. Thus vertically suspended by a single leg, the fly uses its five free legs for manipulating the gnat. Within ten or fifteen seconds it has sucked out its prey, then drops the same and flies away. On a single shrub alongside